

Under-cabinet Lighting System

CLAIMS

5 I claim:

1. A lighting system comprising:

a source of high-frequency power having a high-frequency output;

an interconnecting cord comprising a pair of output conductors enclosed in a common
insulating sheath;

10 said interconnecting cord being connected to the high-frequency output;

an assembly having a pair of input terminals, a high-frequency ballasting circuit, an
enclosure and a lamp socket capable of receiving and supporting a lamp;

the lamp socket having lamp socket terminals;

said enclosure completely enclosing the ballasting circuitry, the interconnecting wiring

15 between the input terminals and the ballasting circuitry, the interconnecting
wiring between the ballasting circuitry and the lamp socket, and the lamp socket
terminals; and

said enclosure not enclosing a gas-discharge lamp.

20 2. The system described in claim 1, wherein the maximum power available from high-
frequency output does not exceed 100 watts.

3. The system described in claim 1; wherein the maximum volt-amperes available from
the high-frequency output does not exceed 100.

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4. The system described in claim 1, wherein the high-frequency output is connected to a
pair of high-frequency output terminals; and

the maximum RMS voltage between the pair of output conductors does not exceed 100
volts.

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5. The system described in claim 1, wherein the high-frequency output is connected to a

pair of high-frequency output terminals; and
the maximum RMS voltage between the pair of output conductors does not exceed 43
volts.

5 6. The system described in claim 1, wherein a reflector is used with the assembly; and
said reflector is located between the assembly and the underside of the cabinet or shelf.

7. The assembly described in claim 1, wherein a diffuser or lens is provided between the
lamp and the surface being illuminated.

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8. The system described in claim 1, wherein the assembly contains two lamp sockets;
said lamp sockets having openings for receiving and powering a single-ended lamp; and
said openings facing in opposite directions.

15 9. The system described in claim 1, wherein the assembly contains two lamp sockets;
said lamp sockets having openings for receiving and powering a single-ended lamp; and
said openings facing in opposite directions and the openings are located on substantially
the same axis.

20 10. The system described in claim 1, wherein a power level selection capability is
provided within said assembly;
the assembly being provided with a socket for power level selection; and
the power level of the luminaire being selected by inserting a plug into said socket or by
changing the location of a plug assembly within the socket.

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11. The system described in claim 1 wherein said pair of input terminals is capable of
piercing said common insulting sheath of the pair of output conductors during the
installation process of the luminaire, each input terminal making electrical contact
with a different conductor.

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12. The system described in claim 11 wherein the assembly can be installed at any

location, along the length of the pair of output conductors.

13. The system described in claim 11 wherein multiple assemblies can be installed at any location, along the length of the pair of output conductors.

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14. The system described in claim 11, wherein the luminaire can be connected to the pair of output conductors in any one of four possible orientations relative to the pair of output conductors.

10 15. An assembly for installation under a cabinet or shelf;
said assembly including a pair of high-frequency input terminals, a high-frequency ballasting circuit, an enclosure and a lamp socket for a single-ended lamp ;
said enclosure completely enclosing the high-frequency ballasting circuitry, the
interconnecting wiring between the high-frequency input terminals and the high-
15 frequency ballasting circuit, and the interconnecting wiring between the high-
frequency ballasting circuit and the lamp socket for a single-ended lamp; and
said enclosure not enclosing the single ended lamp.

16. The assembly described in claim 15 wherein, said enclosure also encloses a second
20 lamp socket for a single-ended lamp.

17. The assembly described in claim 15, wherein a reflector is used with the assembly;
and
said reflector being installed between the assembly and the underside of the cabinet or
25 shelf.

18. The assembly described in claim 15, wherein a diffuser or lens is added between the lamp and the surface being illuminated.

30 19. An arrangement suitable for mounting to a mounting surface comprising: a pair of input terminals, a ballasting circuit, a socket with output terminals that is capable

of receiving, supporting and making electrical connection to a single-ended lamp,
and an enclosure;

the input to the ballasting circuit being connected to the pair of input terminals;

the output of the ballasting circuit being connected to the output terminals within the

5 socket;

the ballasting circuit being capable of properly igniting and powering a gas discharge
lamp when provided with high-frequency power on the pair of input terminals;

the enclosure completely encapsulating the ballasting circuitry, the interconnection

between the input terminals and the ballasting circuitry, the interconnection

10 between the ballasting circuitry and the output terminals of the socket, and the

portion of the output terminals to which the ballasting circuitry connects; and

said enclosure not enclosing a single-ended lamp.

20. The arrangement described in 19, wherein the ballasting circuit is capable of properly

15 igniting and powering a gas discharge lamp when provided with high-frequency
power on the pair of input terminals that is power limited to 100 watts.

21. The arrangement described in claim 19, wherein the ballasting circuit is capable of

properly igniting and powering a gas discharge lamp when provided with high-

20 frequency power on the pair of input terminals; and

said high-frequency power is limited to a reactive power of 100 volt-amperes or less.

22. The arrangement described in claim 19, wherein the maximum RMS voltage between

the pair of input terminals does not exceed 100 volts.

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23. The arrangement described in claim 19, wherein a reflector is used with said

arrangement; and

said reflector being installed between the enclosure and the underside of the cabinet or
shelf.

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24. The arrangement described in claim 19, wherein a diffuser or lens is added between the lamp and the surface being illuminated.

5 25. The arrangement described in claim 19, wherein the arrangement contains two lamp sockets;
said lamp sockets having openings for receiving and powering a single-ended lamp; and
said openings facing in opposite directions.

10 26. The arrangement described in claim 19, wherein the arrangement contains two lamp sockets;
said lamp sockets having openings for receiving and powering a single-ended lamp; and
said openings facing in opposite directions and the openings are located on substantially the same axis.

15 27. The arrangement described in claim 19, wherein a power level selection capability is included; and
the power level of the luminaire being selected by inserting or moving the location of a plug assembly.

20 28. A high-frequency ballasting circuit comprising: a pair of input terminals, a capacitor, a transformer, and an inductor;
the transformer having a primary winding, multiple low voltage secondary windings and a high voltage secondary windings;
the capacitor being connected in series between one of the input terminals and the
25 primary winding of the transformer;
the low voltage secondary windings being suitable for powering the cathodes of a gas-discharge lamp;
the high voltage secondary winding being suitable for connection across a gas-discharge lamp;
30 the high voltage secondary proving sufficient voltage to ignite a gas-discharge lamp;

the lamp current being limited by the capacitor in series with the input terminal and the primary winding; and
the circuit arrangement resulting in a reduction of voltage across the cathodes after the gas discharge lamp has ignited.

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29. An assembly for installation under a cabinet or shelf;
said assembly including a pair of high-frequency input terminals, a high-frequency ballasting circuit, a lamp socket for a single-ended lamp, interconnecting wiring between the high-frequency input terminals and the high-frequency ballasting circuit, interconnecting wiring between the high-frequency ballasting circuit and the lamp socket for a single-ended lamp, and an enclosure;
said high-frequency input terminals being provided with a high-frequency current;
said high-frequency current having a frequency greater than 10,000 Hertz;
said enclosure completely enclosing the high-frequency ballasting circuitry, the interconnecting wiring between the high-frequency input terminals and the high-frequency ballasting circuit, and the interconnecting wiring between the high-frequency ballasting circuit and the lamp socket for a single-ended lamp; and
said enclosure not enclosing a single-ended lamp.

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30. The assembly described in claim 29 wherein, said enclosure also includes a mounting base;
said ballasted socket assembly also provided with a channel;
the high-frequency input terminals being located within said channel; and
said mounting base having holes capable of receiving screws whereby the ballasted socket assembly is mounted directly to the underside of a cabinet or shelf.

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31. An arrangement comprising: a pair of input terminals, a ballasting circuit, a socket with output terminals that is capable of receiving, supporting and making electrical connection to a single-ended lamp, interconnecting wiring between the input terminals and the ballasting circuitry, interconnecting wiring between the ballasting circuitry and the output terminals of the socket and an enclosure;

the input to the ballasting circuit being connected to the pair of input terminals;
the output of the ballasting circuit being connected to the output terminals within the
socket;
the ballasting circuit being capable of properly igniting and powering a gas discharge
5 lamp when provided with a high-frequency voltage on the pair of input terminals;
the enclosure completely encapsulating the ballasting circuitry, the interconnecting
wiring between the input terminals and the ballasting circuitry, the
interconnecting wiring between the ballasting circuitry and the output terminals of
the socket, and the portion of the output terminals to which the ballasting circuitry
10 connects; and
said enclosure not enclosing a single-ended lamp.

32. The arrangement described in claim 31 wherein, said enclosure is provided with a
channel; and

15 the input terminals are located within said channel.

33. A high-frequency under-cabinet lighting system comprising: a high-frequency power
source, an interconnecting cable, and multiple luminaires;
the high-frequency power source being connected to and powered from a standard utility
20 power line and having a high-frequency power output;
the interconnecting cable being connected to said high-frequency power output;
said interconnecting cable not being a track of a track lighting system;
the interconnecting cable being supplied from a manufacturing facility with no luminaires
connected thereto; the system further characterized in that the system is installed
25 by an installer;
during installation, luminaires are connected to a single interconnecting cable at multiple
points along the interconnecting cable using an insulation-displacement
connection; and
the locations of the luminaires being determined by the installer.

30 34. A method of providing under-cabinet lighting, comprising the steps of:

passing a high-frequency output cord along the bottom of a cabinet or a shelf,
placing a ballasted socket assembly over the high-frequency output cord,
positioning a channel provided in the ballasted socket assembly directly over the high-
frequency output cord, and

5 mounting the ballasted socket assemblies to the under side of the cabinet or shelf.

35. The process described in claim 34, additionally characterized by including the step of
positioning a reflector between the ballasted socket assembly and the bottom of
the cabinet or shelf.

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36. The process described in claim 34, additionally characterized by including the step of
orienting the ballasted socket assembly in one of four possible orientations.

37. The process described in claim 34, additionally characterized by including the step of
15 piercing the insulation of the high-frequency output cord with an insulation displacement
connector.

38. A high-frequency under-cabinet lighting system comprising: a high-frequency power
source, an interconnecting cable, and multiple luminaires;
the interconnecting cable being supplied with no luminaires connected there to; and
20 the system further characterized in that multiple luminaires can be powered from the
same interconnecting cable without cutting the interconnecting cable.

39. A luminaire suitable for connection to and being powered from a high-frequency
power source by way of an interconnecting cord;
25 the interconnecting cord comprising a first electrical conductor and a second electrical
conductor encased within and separated from one another by a common insulating
sheath;

the luminaire including two channels intersecting at right angles;
either channel being capable of receiving said interconnecting cord;
30 the luminaire also including a first input terminal and a second input terminal;

the input terminals being designed to pierce the insulation of the interconnecting cord;
and

the input terminals being located within the area of the intersection of the two channels
and positioned, such that, the first input terminal making contact with a first
5 electrical conductor and the second input terminal making contact with the second
electrical conductor during the installation of the luminaire no matter through
which channel the electrical cord is routed.

10 40. The luminaire described in claim 39, wherein the luminaire can be mounted in place
prior to the insertion of the interconnecting cord.

41. The luminaire described in claim 39, wherein the interconnecting cord is installed in
place under the cabinet or shelf before the luminaire is mounted in place under the
cabinet or shelf.

15 42. The luminaire described in claim 39, wherein multiple luminaires can be connected to
the same interconnecting cord.

43. The luminaire described in claim 39, wherein the luminaire can be connected to the
20 interconnecting cord in any one of four possible orientations.

44. The luminaire described in claim 39, wherein the input terminals have a circular or
oval cross-section.

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